Employment of Persons with Epilepsy and Heart Disease

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• **Among persons who are often considered handicapped so far as employability is concerned are two groups deserving of special attention—persons with heart disease because of the ever-increasing number of them, and persons with epilepsy because of the extreme difficulty they have had in getting suitable jobs.**

A considerable number of persons with cardiac disease and a lesser number with epilepsy have been employed by the California Division of Lockheed Aircraft Corporation during the past ten years. It has been the experience there that the employment of such persons, once they are placed in jobs compatible with their physical limitations, has not resulted in unduly increasing the company's liability or labor cost and has not created operational problems of major proportions or jeopardized anyone's safety.

Considerable research and effort are being expended by governmental and other agencies and associations to further enhance the safe placement of such persons. It is believed that these efforts, if coupled with realistic interpretation of the Workmen's Compensation Act in this regard, will bring about more liberal and widespread acceptance of persons with heart disease and epilepsy by industry.

GREAT EFFORTS have been made by many persons and agencies during recent years to alert industry to the employment potentials of physically handicapped persons. Among the so-called handicapped persons are two groups that deserve special attention, the patients with heart disease because of their ever-increasing numbers and epileptic persons because of the extreme difficulty they have had in obtaining employment in the past.

Lockheed Aircraft Corporation has had considerable experience in the employment of both groups and since the medical department is intimate with the problems, we welcome this opportunity to discuss some of our experiences and observations and to describe our procedures and philosophy relevant to the medical aspects of placement of physically substandard employees.

We have been most fortunate in our association with a company noted for its humanitarian and progressive employment policy. This policy, as applied to persons with heart disease, was stated thus by one of our corporate officers in a publication entitled *These Hands Are Able:* "Industry today is hiring more and more handicapped workers. Many are cardiacs. Employers who know the facts about persons with heart disease, who apply proper placement, are making intelligent use of this available work force. At our company, cardiacs have proved capable and efficient. Placed in a job within their capacity, they create no undue liability or safety risk."

This philosophy is incorporated in company directives, which state in substance that it shall be the company's policy to employ physically handicapped persons and permit employees recovering from disabilities to return to work when to do so does not (1) jeopardize either their own safety and well-being or that of their co-workers; (2) unduly increase the company's liability or labor costs; or (3) create operational problems of major proportions.

These principles were translated into workable realities under the capable and sympathetic directorship of the late Dr. Fenn E. Poole. How well he accomplished his job is evidenced in the company's medical rejection and cancellation rate, which is among the lowest in industry. Less than 2 per cent of all applicants technically qualified for available positions are disqualified because of medical evaluation.

Our medical evaluation and placement system operates on the basic philosophy of maximum utilization and minimum wastage of manpower. We feel that even the limited or physically substandard worker, regardless of his handicap, once properly matched to a job ceases to be handicapped for that job and can perform as efficiently and safely as the average worker. This program of selective placement has not, during our association with Lockheed, resulted in increased compensation costs, increased risk to the company or an increased accident rate.

The preemployment or, more descriptively, placement examination is the means most commonly used to evaluate the physical capabilities and/or limitations of the employee and also serves as a baseline and detailed record of his health inventory at the

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time of hire. The medical history is, or should be, the most important phase of the entire examination procedure. At least 75 per cent of all existing disease can be suspected on the basis of symptomatology or information volunteered by the applicant.

Refinements in the placement examination should be directed primarily to eliciting a more accurate and detailed history. This does not necessarily imply the addition of dozens of complex questions disguised to trap the applicant into an admission. Rather it indicates the necessity of educating him in the realization that such information is needed to protect his health and ensure his safe placement.

We use an examination form containing fifty to sixty questions with additional space for recording data from a series of four physical examinations and the physicians' remarks. The examination form serves as a jacket for x-ray films, laboratory reports and pertinent medical correspondence.

A routine examination includes examination of the applicant's vision, using an American Optical Company Sightscreener, urinalysis and stero 4 by 5 inch x-ray films of the chest. Audiograms are made on all employees and additional laboratory studies are ordered in the cases of applicants for certain kinds of jobs—such as painting and de-greasing. Other studies such as electrocardiograms, skeletal roentgenography and blood chemistry determinations, are performed only when indicated on the basis of physical findings or significant history.

CLASSIFICATION OF LIMITATION

The results of the examination and the physician's recommendations must be transmitted in a simple and easily interpretable form to the employment interviewer and eventually to the employee's supervision to make sure any restrictions are complied with. For this purpose a classification system, using six major categories, was developed. It expresses the physical activity, condition or environment to which the employee must not be exposed, rather than classifying him on the basis of positive qualifications for a single job. Since about 75 per cent of our handicapped personnel require limitation with regard to only a single function, this method has proved very effective. We find our system affords flexibility in intradepartmental utilization of the worker and facilitates interdepartmental transfer.

CLASS I. *No hazardous machinery.* Employees having serious visual defects, diabetes, epilepsy, high blood pressure or heart disease may be placed in this category.

An employee limited to Class I is not permitted to operate hazardous power-driven machinery at any time. *Hazardous* power-driven machines include: Saws, routers, lathes, shapers, mills, grinders, drill presses, jig borers, drop hammers, punch presses, shears, radial drills, and others of the kind.

Employees limited to Class I are forbidden to use any of the above machines. In addition they are not permitted to operate a commercial vehicle such as a highway truck, or an in-plant truck such as a goose, tug or tractor, nor an overhead crane if cab-controlled. *Nonhazardous* machines which those limited to Class I may operate, if proficient, include rivet guns, nut runners, hand-drill motors, burring tools and others.

CLASS II. *No heavy lifting.* Employees with heart disease, back or joint trouble, improperly supported hernias or high blood pressure may be placed in Class II.

Men limited to Class II are not permitted to lift more than 25 pounds at any time. Women limited to Class II are forbidden to lift more than 10 pounds and should not be required to do constant lifting.

(Women employees without medical limitations are forbidden to lift more than 25 pounds under any condition. No woman employee shall be requested or permitted to carry any object weighing 10 pounds or more up or down any stairway or series of stairways that rise more than 5 feet from its base.)

Pushing or pulling weights requiring draw bar force in excess of 50 pounds is prohibited for male employees with Class II limitation. Female employees with Class II limitation are restricted to draw bar force of 25 pounds.

CLASS III. *Ground level work.* Employees with high blood pressure, diabetes, epilepsy and heart trouble, who are susceptible to bouts of dizziness or fainting spells may be included in this class. In addition, those having a deformity or disease of the spine or lower extremities may require this limitation.

An employee limited to Class III is not permitted to work on ladders, scaffolding, airplane wings or temporary jigs or in any other unprotected elevation.

Second and third floors of permanent, protected jigs and buildings, and the lower three steps of a five-step ladder are not considered hazardous for Class III limitation. Walking up and down stairs to and from such places of work is not a violation of the limitation.

Movable steps, ramps or raised platforms designed to facilitate working in permanent jigs and fixtures, such as those found on the assembly lines are not considered hazardous for Class III limitation.

CLASS IV. *Avoid contact with or exposure to specified agent.* Employees suffering from chronic sinus trouble, bronchitis, asthma and skin allergies may require this limitation.

An employee limited under Class IV must be placed where he will not come into contact with the specific agent or agents designated by the medical department. Irritants are generally chemicals, fumes, dusts or other agents that may be inhaled or come into direct contact with various portions of the body.

Allergic responses to these irritants vary between persons and sometimes occur without prolonged exposure or contact. The presence of the irritant in the air may be sufficient to produce a reaction.

CLASS V. *No extensive walking or standing.* Employees suffering from back disorders, lower extremity defects and varicose veins may require this limitation.

An employee limited to Class V is not permitted to walk or stand more than 50 per cent of the working shift. Sedentary bench or desk work is best for employees limited to Class V. Work permitting alternate sitting and standing is permissible and frequently desirable.

CLASS VI. *Miscellaneous.* Limitation to Class VI indicates the presence of a physical condition which must be shown special consideration. Employees with ear disease, nervous disorders, chronic back distress, bursitis and allied conditions may require this limitation.

All conditions which require limitation and are not included in the first five categories are placed in this class. When this class is used, the specific nature of the limitation is stated.

For example: An employee who should not be exposed to noise would be restricted to Class VI, "Not to work in an area where noise levels are above 95 decibels"—drop-hammer operator, riveter, aircraft mechanic. Or a woman with a severe strain of the elbow might be limited as follows: Class VI, "Not permitted to use hand tools requiring squeezing."

All medical information concerning the employee is considered privileged and confidential, and we forward only the numerical classification of limitations to the employee's department. To facilitate compliance and enforcement of the limitations, it was decided to display the limit by number on the employee's badge. Contrary to the fears and expectations of some, open identification of our physically substandard employees did not arouse a storm of complaints; a few employees asked that it be removed, but it has been generally accepted. The on-the-job supervisors of handicapped workers have found it fairly simple to comply with limitations when they are constantly in evidence, and safety engineers are able with a minimum effort to ascertain that a worker is not placed in a job proscribed for him.

Job evaluation is the second major component in the process of selective placement, as it defines the physical requirements for each job as well as the potential risk or hazard involved. From the medical standpoint, an ideal job evaluation is one that defines exact energy requirements as well as the type and degree of body movements and environmental exposure. However, since few routine physical examinations are designed to measure energy potentials, less refined procedures are and can be utilized. The job analysts in our wage and salary section outline the basic and overall technical and physical requirements of each job. The safety engineers, in their own studies, determine the physical risks and potential hazards associated with each operation. Finally, in making requisitions for workers, each department head must complete a detailed form in which he lists the degree and type of physical activity for the specific job and the environmental conditions to be encountered. This information is conveyed to the employment or placement interviewer, who in turn receives the results of the medical evaluation from the physician. It is, of course, the sole and inviolate responsibility of the medical department to determine the extent of body function or physical stress that is safe for the applicant. The placement expert can then extrapolate the medical evaluation in terms of fitness for any job.

We have made several recent studies of our employees who have heart disease or epilepsy. Out of a total work force of 31,000 we were able to identify 725—or 2.4 per cent—employees with cardiovascular disease. This indicates the number of known cases brought to the attention of the medical department. Of the 725, 301 had hypertension, 220 had some form of coronary artery disease, 40 had rheumatic heart disease, 13 had valvular cardiac disorders, 57 had heart disease of undetermined origin and the remainder other less prevalent forms of vascular disease.

WORKERS WITH HEART DISEASE

Dealing with workers with heart disease raises some interesting problems in employment. Heart disease is fairly prevalent among the working population and is the cause of 45 per cent of all adult deaths, the majority attributable to coronary artery disease. Other cardiac conditions, such as congenital defects, valvular disorders, rhythmic disturbances and hypertensive heart disease frequently cause abnormalities that can be detected during a cursory examination of the heart and blood pressure, but coronary artery disease is insidious in that pathological changes frequently occur before any abnormality is demonstrable.

The incidence of secondary occlusions in persons

with coronary artery disease is high, and a damaged heart muscle implies a limited functional reserve. Lightheadedness and faintness may occur and under conditions of extreme physical exertion or emotional stress coronary artery spasm may be precipitated in diseased blood vessels. For these reasons an accurate diagnosis and physical evaluation is essential so that the applicant or employee may be placed in a job involving minimal risk to himself and protecting the employer against unjust and extensive liability.

At Lockheed, once cardiac disease has been diagnosed, work limitations are imposed in accordance with our placement standards. Usually, lifting weights of more than 25 pounds is forbidden, and the employee may work only at ground level. In more severe cases it is necessary to impose limitations ensuring minimal standing, no operation of hazardous machinery and occasionally no work entailing unusual mental stress.

All employees with limitations for heart disease are reevaluated six months after employment to ensure adequacy of placement. The frequency of additional examinations is determined on an individual basis. It would, of course, be ideal to precisely determine the energy potentials of each applicant with heart disease and to match this with individual job requirements. In a company such as Lockheed, with many hundreds of job classifications and numerous applicants with heart disease, it would be difficult to preform these precise measurements. Placement philosophy, therefore, entails conservative limitations for all workers with heart disease to ensure employment well within their reserve potentials.

It is occasionally necessary to reject applicants with severe cardiac conditions as being medically unsuited for work of any kind. Applicants who have had multiple coronary occlusions or who have active heart failure and persons who have severe congenital defects and are in imminent danger of heart failure are deemed unemployable. Employees in whom heart disease develops after they are hired are required to obtain maximum treatment before they are permitted to return to work. Careful cardiac evaluation is then instituted and every attempt made to return the employee to his former position or, if that is not compatible with his work restrictions, to retain him in an equivalent capacity.

It has been our experience that once a person with heart disease is placed in a suitable job, he ceases to be handicapped. The work efficiency and output, the accident rate, attendance and motivation of such persons are at least as good as for other employees. They pose essentially the same problems as any physically substandard employee with regard to loss of flexibility for job transfer.

Approximately 18 per cent of the employees at Lockheed are physically limited. Almost 20 per cent of those who are limited have cardiovascular disease. Many of them had the disease at the time of employment. This raises a frequently asked question: Is the employment of such persons of major importance in increasing sickness and life insurance rates, and what is their liability potential relative to workmen's compensation?

Of approxmately 40,000 men and women hired at Lockheed during the years 1951 and 1952, 19 died of coronary artery disease and two of other cardiac conditions. In only four cases was a history of heart disease elicited at the time of hiring, and in only three of these were objective physical findings present. Heart disease accounted for 48 per cent of deaths in the entire personnel, a figure which compared closely with mortality data of the general adult population in Los Angeles County. In view of this close approximation, we concluded that working stress at Lockheed had no special influence upon the death rate.

Ninety-five per cent of all employees who died of heart disease were more than 40 years of age and the median age was 53. The great majority of deaths occurred during nonworking hours. In no case was a serious question raised concerning compensability under the Workmen's Compensation Act. It has been our policy to have a visiting nurse talk with the immediate relatives as soon as possible after the death of an employee and to act as the company representative in all matters pertaining to the death, including those pertaining to pecuniary benefits. This practice tends to establish a good rapport with the family and is invaluable from a public relations standpoint. It tends to negate subsequent misinformation conveyed to relatives from many poorly informed sources.

MORE SENSITIVE EXAMINATION NEEDED

Since fewer than 20 per cent of employees who died of heart disease within two years after they began work were known by the company to have cardiac abnormality at the time they were hired, it is obvious that refinement of the examination procedures is needed. Routine electrocardiograms on all applicants are, we feel, not justified as a mass screening procedure. However, for applicants over 40 this test may be economically and medically feasible. A one-lead electrocardiogram, using the first lead recorded by a direct writing machine, has been used in some clinics as a rapid screening procedure, although it is of doubtful value since some conditions (posterior coronary disease) are not manifested in Lead 1.

Within the last several years additional tests have

been advocated for diagnostic and prognostic purposes. Of these, the Gofman test or atherogenic index determination, the blood cholesterol determination and the microchylom index or dark field test of Griffith have received considerable attention. We have explored the possibility of using these procedures but find them to be impracticable for routine screening purposes. Several of the tests are expensive, complex and time-consuming. It is doubtful that they contribute more, prognostically, than does a history of familial heart disease. A quick-acting, economical and simple screening test for coronary heart disease remains to be developed.

Considerable research has been carried out in an attempt to precisely evaluate persons with heart disease for employment. The United States Department of Public Health recently sponsored an extensive cardiac rehabilitation project which was conducted, in part, at Lockheed. One objective of the study was to accurately determine the energy requirements of different jobs and define the oxygen consumption per unit of body area for normal persons and persons with heart disease. This phase of the program was conducted entirely on Lockheed worker volunteers. The second phase consisted of a series of tests, including pulmonary compliance studies, determinations of chemical contents of the blood, treadmill tolerances, electrocardiograms and others, performed at a special laboratory in one of the largest hospitals in Los Angeles. On the basis of these studies, it was hoped to develop a physical fitness index by which a subject could be classified on the basis of his ability to perform muscular work. It was hoped that the physical fitness indices might be standardized within a normal range and that an abnormal index for persons with heart disease could be extrapolated in terms of the known energy requirements for various jobs.

Of more immediate importance has been the establishment of the Work Classification Unit of Cardiacs in Industry Committee of the Los Angeles County Heart Association. The staff consists of several cardiologists, a job analyst, a social worker and an administrator. Persons with heart disease in need of evaluation are referred to the Work Classification Unit, where complete studies are performed. These include medical and emotional evaluation, social history and job analysis. Upon completion of the studies, a conference is held between the physicians and their co-workers, and a decision is rendered as to the subject's ability to perform a given job. Through this means, a just, honest and scientific diagnosis is reached and realistic recommendations made concerning the work capabilities of persons with heart disease. At present the unit accepts only persons who meet the following requirements: They must wish to have an evaluation of their work potential, must be referred by an industrial physician, must have had a diagnosis of heart disease, must be employed and have an employment problem with regard to the cardiac abnormality. This service is offered without charge to the subject or the employer. It is an initial effort and, unfortunately, must be limited in scope of selection, although it is hoped to extend the program later to provide a greater degree of coverage.

COMPENSATION FACTORS

On the darker and more pessimistic side are recent interpretations of the Workmen's Compensation Act by the Industrial Accident Commission and the highest courts of California which threaten to retard the progressive employment practices of many companies—decisions which imply, in effect, that almost any disease or injury occurring while the employee is on company premises is compensable. It now appears that an injury received in a fall to the floor, regardless of the cause, may be compensable. A person with heart disease who loses his balance as a result of lightheadedness or vertigo, or one who falls as a result of a coronary seizure, can now incur a potentially compensable injury.

Heart disease is a progressive disorder entailing the possibility of unpredictable calamity—which must be recognized in any just compensation law. Much confusion exists concerning definition of such words as *disease* and *disability*, and clarification is needed. Compensation adjudication procedures must be corrected to fairly limit the liability now assumed almost entirely by the employer. Secondary injury laws have proved ineffective in practice and the Subsequent Injuries Fund in California, which is useful in some disorders, is of doubtful value in cases of heart disease. It has been aptly stated that current decisions by the courts and the Industrial Accident Commission have done more to hurt the cause of persons with heart disease, epilepsy and other chronic diseases than all the good accomplished by the arduous efforts of many fine organizations, companies and individuals. What is most distressing is the effect upon those far-sighted companies with the most liberal and progressive policies who are most vulnerable by virtue of continuing these policies in force.

In 1953 a special attempt was made at Lockheed to gather data on all known epileptics employed in the company and subsequently to evaluate their progress. One of the objectives of the study was to determine whether it was possible to remove all work limits after a number of years free of seizures. During a three-year period data was kept on 63 epileptic employees, 15 of whom were military veterans. The

average age was 37 years. Only one-third of these employees admitted they knew at the time they were hired that they had epilepsy. In addition, five applicants who identified themselves as epileptics at the time of applying for jobs could not be employed because of medical limitations. Among the 63 who were employed, 14 had been with Lockheed more than ten years. The average duration of employment was 5.2 years. Seven of the 63 were females. The majority of subjects had grand mal epilepsy. Twenty-eight were under the regular care of a physician and taking medication. Thirty-six were employed in medium or upper income positions.

Twenty-two left the employment of the company during the period of the study. Seven voluntarily terminated employment, four were laid off during production cut-backs, and four were discharged by the company, two of them because seizures were not adequately controlled by medication. The remaining seven either transferred to other divisions or did not return from sick leave.

Applicants for employment are encouraged to reveal that they have epilepsy. We never arbitrarily reject epileptic persons for employment but attempt to place them in positions compatible with their physical limitations. This generally involves the application of limitations prohibiting these persons from operating power-driven machinery and/or driving vehicles and from working on unprotected overhead platforms. This, we feel, tends to minimize the possibility of serious injury in the event a seizure occurs without sufficient forewarning to permit the subject to sit down. Seizures of the grand mal or Jacksonian type, when they occur without foreknowledge, tend to have an adverse effect upon the morale of fellow workers and to cause work delays.

It is extremely difficult to diagnose epilepsy on the basis of the preplacement physical examination. In the majority of cases the medical department first becomes aware of the existence of epilepsy as the result of a spontaneous seizure occurring during employment or by information obtained from other sources. Occasionally a first attack of epilepsy will occur in a young adult after his employment, but in the majority of cases the employee deliberately falsifies his medical history.

Falsification of medical records at the time of original employment is cause for dismissal. Occasionally this prerogative has to be exercised by the company when applicants deliberately refuse to allow the medical department to evaluate their disorder and properly place them in a suitable job assignment.

In our experience, for the most part, epileptic employees under adequate medical control perform as effectively as the majority of other employees. We have found no unusual incidence of mental deterioration or reduced cerebral capacity. To the contrary, several important positions are being capably filled by epileptic persons. We have noted a tendency for the frequency of seizures to decrease with time in almost all types of epilepsy, with the possible exception of Jacksonian seizures. The latter are a most difficult problem, in that they are hard to control and are frequently precipitated by relatively minor trauma to the head.

There are a number of groups in the Southern California area who are active in the rehabilitation of epileptic persons. One such group, Epi-Hab, sponsors a workshop in Culver City and trains epileptic persons as skilled machine operators and technicians. Medical surveillance is provided at all times. Although seizures among the workers are not uncommon, there have been no injuries owing to the seizures despite the fact the subjects are operating potentially hazardous power-driven machinery.

Among the epileptic persons at Lockheed are engineers, fabricators, stock clerks and shipping clerks, electricians, assemblers, inspectors, painters, mechanics, stenographers, executives and maintenance men.

As with other employees who have medical limitations, the chief operational problem with regard to workers who have epilepsy is loss of flexibility in job transfer. Perhaps more important in employment consideration is the possibility of an employer's incurring excessive potential liability as the result of injuries that occur during seizures. As in the case of employees with heart disease, it appears that injuries caused by the worker's falling, regardless of the idiopathic nature of the seizure, are compensable under the Workmen's Compensation Act. Hence employers are extremely reluctant to hire epileptic persons. The solution once again lies in a more realistic understanding of the problem, especially as it pertains to the legal responsibility of the employer. The majority of epileptic persons should have no difficulty in getting jobs for which they have the necessary training and technical skill, provided their seizures are under adequate control and hiring them involves the employer in no major medical/legal problems.

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